

BrachyVAC Treatment Of Superficial Malignancies- Results Of A Consecutive Case Series

Goodman MA, Weiss KR, and McGough RL

University of Pittsburgh Medical Center, Pittsburgh, PA

Background

Treatment of superficial spreading sarcomas is difficult¹. These tumors involve the skin, requiring skin sacrifice for adequate margins. Reconstruction is often necessary. Tumor visualization is also difficult, and the risk of positive margins is high. Further, treatment often includes radiation, especially when the surgical margin is compromised or difficult to determine. This can produce substantial soft tissue complications.

Since 2010, we have used a combination of resection, brachytherapy, and delayed reconstruction for select superficial malignancies. In this technique, the tumor with all affected skin is widely removed and confirmed with frozen section. Brachytherapy catheters are placed, and the soft tissue defect is covered using a VAC sponge (Kinetic Concepts, Inc). The patient then undergoes brachytherapy, delivering a radiation dose of 45-50 Gy. Plastic reconstruction is then performed if the final oncologic margin is negative. If positive, further excision is performed. This technique, entitled BrachyVAC, was first presented at MSTS in 2013², and the technique published in 2014³.

The purpose of this study is to investigate our two to five-year results using this. We propose to investigate both oncologic factors and soft tissue factors.

Questions

1. Are the oncologic results comparable to published data for patients undergoing conventional treatment?
2. Does this technique minimize soft tissue complications?

Patients and methods

Since the development of this technique, all patients who presented with biopsy proven infiltrative intermediate to high-grade sarcomas or squamous carcinomas have been considered. In determining eligibility, only subjects who would have a substantial soft tissue defect requiring reconstruction either with a skin graft or flap-graft combination were included. Those perceived to be amenable to primary closure were excluded. All subjects underwent sequential treatment as described above.

Results

17 patients (11 female, 6 male) underwent BrachyVAC. The average age was 62 years (range from 33-91 years). Diagnostically, 15 patients had intermediate or high-grade infiltrative sarcomas (7 myxofibrosarcomas, 4 leiomyosarcomas, 1 rhabdomyosarcoma, 1 epithelioid sarcoma, 1 myxoid liposarcoma, one high-grade liposarcoma metastatic to the arm), and two had high-grade infiltrative squamous cell carcinomas. Ten of the 17 subjects (59%) presented with recurrent tumors (8 sarcomas, both squamous cell carcinomas). Of the 17, three could not be oncologically assessed, two due to short follow-up (less than 6 months) and one due to immediate amputation after final diagnosis of epithelioid sarcoma was discovered. 16/17 could be assessed for soft tissue complications (>6mos postop).

Of the 14 who have been followed oncologically, three died of disease. No other metastases occurred. None of those with mets had a local recurrence. 3/14 (21%) subjects did have local recurrences (2 myxofibrosarcomas, 1 leiomyosarcoma), requiring further surgery.

16/17 subjects could be assessed for soft tissue reconstructions. One patient was able to be closed primarily following brachytherapy. Of the remaining 15 who required reconstruction, three required only split thickness skin grafts. The remaining twelve needed a variety of rotational or free flaps depending upon anatomy. Only one complication occurred: one primary skin graft sloughed requiring debridement.

Conclusions

This study presents a novel technique for dealing with a difficult group of tumors. These neoplasms are fitful, and positive margins are very common due to their infiltrative nature. They are also difficult to reconstruct, as soft tissue complications are rife when skin grafts are combined with radiotherapy.

BrachyVAC therapy has several advantages. It allows ample skin to be removed, minimizing positive margins and local recurrences. While the local recurrence rate of 21% seen in this series is not trivial, it does demonstrate good local control considering the propensity for recurrence in this patient cohort (59% presenting with recurrent disease, 41% myxofibrosarcomas). BrachyVAC also allows optimal management of the soft tissues, allowing re-operation before placement of a soft tissue reconstruction (none needed in this cohort), and avoiding any radiotherapy to the skin grafts. The soft tissue complication rate in this series was 6%. Overall, this represents a viable treatment scheme for this most difficult group of tumors.

References

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